What is claimed is:

1. A ferromagnetic group IV-based semiconductor or a ferromagnetic group III-V-based or group II-VI-based compound semiconductor, comprising a group IV-based semiconductor or a group III-V-based or group II-VI-based compound semiconductor, which contains at least one rare-earth metal element selected from the group consisting of Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu.

2. The ferromagnetic group IV-based semiconductor or the ferromagnetic group III-V-based or group II-VI-based compound semiconductor as defined in claim 1, which is doped with at least one of an n-type dopant and a p-type dopant.

3. A ferromagnetic group III-V-based compound semiconductor comprising a group III-V-based compound semiconductor, which contains Gd and a donor.

4. The ferromagnetic group III-V-based compound semiconductor as defined in claim 3, which is doped with at least one of an n-type dopant and a p-type dopant.

5. A magnetooptic spin electronic device comprising the ferromagnetic semiconductor as defined in either one of claims 1 to 4, said device being adapted to utilize a magnetooptic effect of said ferromagnetic semiconductor.

6. A method of adjusting a ferromagnetic characteristic of a ferromagnetic group IV-based semiconductor or a ferromagnetic group III-V-based or group II-VI-based compound semiconductor, comprising adding either one of:

(1) at least two rare-earth metal elements selected from the group consisting of Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu;

(2) said at least two rare-earth metal elements, and at least one metal element selected from the group consisting of Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No and Lr; and

(3) said (1) or (2), and at least one of an n-type dopant and a p-type dopant,

to a group IV-based semiconductor or a group III-V-based or group II-VI-based compound semiconductor, so as to adjust said ferromagnetic characteristic according to a combination of said rare-earth metal elements.

7. The method as defined in claim 6, wherein said ferromagnetic characteristic is a ferromagnetic transition temperature.

8. The method as defined in claim 6, which includes adding said at least two rare-earth metal elements to said group IV-based semiconductor or group III-V-based or group II-VI-based compound semiconductor to form a mixed crystal of them, so as to adjust an energy in a ferromagnetic state, and allow the energy to be reduced as a whole according to a kinetic energy of a hole or electron introduced from said rare-earth metal elements by themselves, to stabilize said ferromagnetic state.

9. The method as defined in claim 6, which includes adding said at least two rare-earth metal elements to said group IV-based semiconductor or group III-V-based or group II-VI-based compound semiconductor to form a mixed crystal of them, so as to control the magnitude and the positive/negative sign of the magnetic interaction between the rare-earth metal atoms, and a light transmission characteristic to be obtained from said mixed crystallization of said rare-earth metal elements, according to a hole or electron introduced from said rare-earth metal elements by themselves, to provide a desired light filter characteristic in said ferromagnetic semiconductor.

10. A method of adjusting a ferromagnetic characteristic of a ferromagnetic group IV-based semiconductor or a ferromagnetic group III-V-based or group II-VI-based compound semiconductor, comprising adding either one of:

(1) at least one rare-earth metal element selected from the group consisting of Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb and Lu;

(2) said at least one rare-earth metal element, and at least one metal element selected

from the group consisting of Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No and Lr; and

(3) said (1) or (2), and at least one of an n-type dopant and a p-type dopant,

to a group IV-based semiconductor or a group III-V-based or group II-VI-based compound semiconductor, so as to control the concentration of one of said at least one rare-earth metal element, said at least one metal element selected from the group consisting of Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No and Lr, and said at least one of an n-type dopant and a p-type dopant, to adjust said ferromagnetic characteristic.

11. The method as defined in claim 10, wherein said ferromagnetic characteristic is a ferromagnetic transition temperature.

12. The method as defined in claim 10, which includes:

providing at least two of said rare-earth metal elements; and

adding said at least two rare-earth metal elements to said group IV-based semiconductor or group III-V-based or group II-VI-based compound semiconductor to form a mixed crystal of them, so as to adjust an energy in a ferromagnetic state, and allow the energy to be reduced as a whole according to a kinetic energy of a hole or electron introduced from said rare-earth metal elements by themselves, to stabilize said ferromagnetic state.

13. The method as defined in claim 10, which includes:

providing at least two of said rare-earth metal elements; and

adding said at least two rare-earth metal elements to said group IV-based semiconductor or group III-V-based or group II-VI-based compound semiconductor to form a mixed crystal of them, so as to control the magnitude and the positive/negative sign of the magnetic interaction between the rare-earth metal atoms and a light transmission characteristic to be obtained from said mixed crystallization of said rare-earth metal elements, according to a hole or electron introduced from said rare-earth metal elements by themselves, to provide a desired light filter characteristic in said ferromagnetic semiconductor.